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Atty. Dkt. No. 026032-4364

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: David J. Spykerman, et al.

Title: BY-WIRE ENABLED CONSOLE

Appl. No.: To be determined

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Examiner: To be determined

Art Unit: To be determined

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Sir:

Transmitted herewith for filing under 37 C.F.R. § 1.53(c) is the provisional patent application of:

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Enclosed are:

[**X**] Specification (16 pages).

[**X**] Informal drawings (7 sheets, Figures 1-7).

[**X**] Application Data Sheet (37 CFR 1.76) (5 pages).

The filing fee is calculated below:

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Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date 12/10/03

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U.S. PROVISIONAL PATENT APPLICATION

for

BY-WIRE ENABLED CONSOLE

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BY-WIRE ENABLED CONSOLE

FIELD OF THE INVENTION

[0001] The present invention relates generally to vehicle console systems that have transmission controls coupled to them. More particularly, the present invention relates a console system utilizing shift by-wire technology to provide a movable and selectively reconfigurable console.

BACKGROUND

[0002] Storage receptacle systems, such as consoles, for use with a vehicle are generally known. The popularity of console systems in vehicles has continued to increase with the popularity of SUVs, vans, light trucks, and the like, as well as cars having split front seats. Consoles are known to provide enhanced functionality, such as storage bins for CDs, DVDs, mobile telephones, maps, sun glasses, change bins, as well as additional features such as power ports, electronics (e.g. televisions, stereos, navigational systems, etc.), cup holders, trays, and the like. In some vehicles, the transmission controls and/or the parking brake may be part of the center console, as may a variety of controls for such vehicle components such as lights, heating and cooling systems, mirrors, fuse panels, etc.

[0003] As mentioned above, it is commonly known to place transmission controls as part of a console. The positioning of the transmission control in a console may provide a more sophisticated, sportier or ergodynamically design for an

occupant. Transmission controls generally include a gear shift lever device and a base member for allowing an occupant to select an appropriate gear.

[0004] The gear shift lever device may be configured to control a traditional automatic transmission (which allows selection of different gears as well as the usual park, reverse, neutral and standard automatically shifted drive position) or a manual transmission such as a conventional H-floor shift pattern. Conventionally, a gear shift lever device for a vehicle is coupled to the transmission of the vehicle by a large and complicated mechanical linking mechanism. The mechanical linkage extends from inside the vehicle to the transmission.

[0005] By-wire technology has been developed as an alternative to the traditional mechanical linkage mechanism. By-wire technology generally relates to replacing conventional mechanical linkage connections in a vehicle with electrical and electronic systems. By-wire technology is commonly divided into the categories of "drive by-wire technology" (i.e. by-wire technology pertaining to throttle control) and "shift by-wire technology" (i.e. by-wire technology pertaining to transmission control).

[0006] Shift by-wire technology replaces the mechanical linkage existing between the gear shift lever and the transmission with a gear shift lever sensor which produces an electric output signal corresponding to the shift lever position. The electric output signal is detected by an actuator such as a solenoid or a motor is driven in according to an output signal from the positioning sensor to drive a member for shifting the transmission. With the shift-by-wire transmission shifting means, there is no need to provide mechanical linkage between the engine compartment and the inside of the vehicle.

[0007] The large mechanical linkage conventionally existing between the gear shift control lever device and the transmission undesirably limits the possible configurations and usability of a console to which it is coupled or contained within. Console systems including conventional transmission controls are not detachably removable or slidably movable (both of which are advantageous features commonly used with consoles systems not including incorporating transmission controls). For example, mechanical linkage extending from a console to the transmission would inhibit the fore and aft displacement of the console. In addition, the large size of the mechanical linkage requires a console to be configured around the linkage. Advantageous features possible for a console such as additional storage compartments, streamlining the console by covering infrequently used components, displacement of the console, etc. may not be possible when conventional transmission controls are included in the console configuration.

[0008] Therefore, it would be advantageous to provide a console configuration having a transmission control device, wherein the transmission control device may be moveably coupled to the console to expose and/or cover additional components included in the console. It would further be advantageous to provide a console configuration having a transmission control device wherein the console is movably positionable throughout the vehicle. It would further be advantageous to provide console having transmission controls that is coupled to one or more of the movably positionable forward seats of a vehicle. It would further be advantageous to provide a console having transmission controls that is coupled to one of the forward seats of a vehicle and may be configured to move to allow access between the front and rear portions of a vehicle.

[0009] Accordingly, it would be advantageous to provide a console having these or other advantageous features.

SUMMARY OF THE INVENTION

[0010] The present invention relates to a console system for use in a vehicle. The console system comprises a base member coupled to the vehicle. The base member supports a plurality of components and a by-wire shifter assembly. The shifter control assembly is configured to be movable between an open position and a closed position, wherein components are exposed in the open position and are covered by the shifter assembly in the closed position.

[0011] The present invention further relates to a movable console system for use in a vehicle. The movable console system comprises a base member movably coupled to the vehicle. The base member supports a by-wire shifter assembly having a gear shift lever and a support member. The base member may be moved within the vehicle without interfering with the functionality of the shifter assembly.

[0012] The present invention further relates to seat-mounted console system for use in a vehicle. The seat-mounted console system comprises a base member configured to be coupled to a movable vehicle seat. The base member supports a by-wire shifter assembly.. The vehicle seat may be moved within the vehicle without interfering with the functionality of the shifter assembly.

[0013] The present invention further relates to an instrument panel-mounted console. The instrument panel-mounted console comprises a base member movably coupled to an instrument panel and configured to support a by-wire shifter

assembly. The base member is selectively positionable by an operator to provide optimal placement of the shifter assembly.

[0014] The present invention further relates to various features and combinations of features shown and described in the disclosed embodiments. Other ways in which the objects and features of the disclosed embodiments are accomplished will be described in the following specification or will become apparent to those skilled in the art after they have read this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIGURE 1 is a perspective view of a by-wire enabled vehicle console according to a preferred embodiment.

[0016] FIGURE 2 is a perspective view of a by-wire enabled vehicle console having a pivotally coupled shifter assembly according to an exemplary embodiment.

[0017] FIGURES 3a and 3b are perspective views of a by-wire enabled vehicle console having a slidable shifter assembly shown an different positions.

[0018] FIGURE 4 is a perspective view of a by-wire enabled seat-mounted console according to an exemplary embodiment.

[0019] FIGURE 5 is a plan view of a selectively positionable by-wire enabled seat-mounted console according to an exemplary embodiment.

[0020] FIGURES 6a through 6c show different positions of an instrument panel-mounted, by-wire enabled vehicle console according to an exemplary embodiment.

[0021] FIGURE 7 is a perspective view of a fold-up by-wire enabled console according to an exemplary embodiment.

[0022] In the various drawings, like reference numerals are used to indicate like components.

DETAILED DESCRIPTION OF THE PREFERRED AND ALTERNATE EMBODIMENTS

[0023] Referring to FIGURE 1, a console system 10 is shown according to a preferred embodiment. Console system 10 includes a body (e.g. platform, support, housing, frame, etc.) shown as base member 20, a plurality of articles (e.g. cup holders, storage receptacles, compartments, containers, power ports, devices, fuse panels, consumer objects, etc,) shown generally as components 30, and a transmission control assembly (e.g. gear shift lever device, PRNDL, etc.) shown as shifter assembly 40. Base member 20, components 30, and shifter assembly 40 cooperate to provide a moveable and/or selectively configurable or reconfigurable console system for use in a vehicle. In a particularly preferred embodiment, console system 10 is shown for use within the interior of an automobile. The console system may be used with any other type of motor vehicle (e.g. minivan, sport utility vehicle, truck, recreation vehicle, etc.) or other vehicle applications such as farm and construction equipment.

[0024] According to a preferred embodiment of console system 10, as shown in FIGURE 1, base member 20 is coupled to both a floor and an instrument panel of the vehicle.. Alternatively, base member 20 may be coupled to a variety of vehicle structures including, but not limited to, floors, interior side panels, overhead systems, seating systems, instrument panels (i.e. dashboards), and track systems. According to a particularly preferred embodiment, base member 20 is laterally (i.e.

side to side) centered within the vehicle and is generally positioned between the two front seats of a vehicle to serve as a divider (e.g. boundary, separator, border, etc.) between the seats. In an alternative embodiment, base member 20 is laterally centered within the vehicle, but instead of dividing the front seats, base member 20 is nested under the dashboard of the vehicle.

[0025] As illustrated in FIGURE 1, base member 20 is coupled to the vehicle in a manner so that base member 20 will remain substantially stationary. Base member 20 may be coupled to the vehicle through the use of clips, heat stakes, screws, rivets, bolts, adhesives, snaps, fasteners, ultrasonic welding, or any combination of these or other conventionally known methods or techniques. In an alternative embodiment, base member 20 is coupled to track system providing for the slidable movement of console system 10. The coupling of a console to a track system is generally known. A typical track system generally comprises a guide (e.g. track, channel, slot, etc.) and a follower configuration that functions similarly to mechanisms used to provide the slidable movement of vehicle seats. Providing for the slidable movement of console system 10 may advantageously allow occupants in the rear of a vehicle to enjoy the functionality of the console. Further, coupling base member 20 to a track system may allow console system 10 to be moved so that occupants may acquire access to areas throughout the vehicle otherwise limited by the console. Base member 20 may be coupled to a track system providing slidable movement in the fore and aft direction of the vehicle, or alternatively, in a lateral direction.

[0026] Referring again to FIGURE 1, a plurality of components 30 are incorporated or coupled to base member 20. Base member 20, as shown in

FIGURE 1, includes components 30 such as beverage retainers 32, an armrest 34, a storage receptacle 36 (positioned under armrest 34), and controls 38. In an alternative embodiment, a variety of components 30 (e.g. compartments, fuse access panels, containers, power ports, electrical and electronic devices, consumer objects, etc.) may be coupled to or incorporated with base member 20.

[0027] Still referring to FIGURE 1, a shifter assembly 40 is coupled to base member 20. Shifter assembly 40 includes a support member 42 and gear shifter lever 44. Gear shift lever 44 is coupled to the transmission (not shown) of the vehicle using shift by-wire technology. Shift by-wire technology replaces the conventional mechanical linkage existing between gear shift lever 44 and the transmission with a gear shift lever sensor which produces an electric output signal corresponding to the shift lever position. The electric output signal is detected by an actuator such as a solenoid or a motor is driven in according to an output signal from the positioning sensor to drive a member for shifting the transmission.

[0028] Support member 42 is coupled to base member 20 of console system 10, and defines the shift pattern for gear shift lever 44. According to a preferred embodiment, the shift pattern of support member 42 is configured as a traditional automatic transmission (which allows the selection of different gears as well as the usual park, reverse, neutral and standard automatically shifted drive position). In an alternative embodiment, the shift pattern of support member 42 is configured as an automatic transmission providing a user with the feel of a conventional H-floor shift pattern (i.e. just like a manual transmission).

[0029] The use of shift by-wire technology advantageously allows flexibility in the configuration of console system 10 that is not possible with a conventional

transmission assembly being coupled to a console. According to a preferred embodiment, support member 42 of shifter assembly 40 is moveably coupled to base member 20. Referring to FIGURE 1, support member 42 is slidably coupled to base member 20, and is configured to slide in the fore and aft direction of the vehicle. The slidable coupling of shifter assembly 40 enables the optimal positioning of shifter assembly 40 regardless of the dimensions of an operator. For example, a relatively tall person is likely to slide the driver seat towards the rear of the vehicle while a relatively short person is likely to slide the driver seat towards the front of the vehicle. By slidably coupling shifter assembly 40 to a console system 10, the operator may position the gear shift lever 44 to correspond to the positioning of the driver seat. Shifter assembly 40 may be configured to manually slide in fore and aft direction, or electronic and electrical systems may provide for the slidable movement of shifter assembly 40.

[0030] According to a particularly preferred embodiment, support member 42 is moveably coupled to base member 20 and is positioned over components 30 that are incorporated into base member 20. By movably coupling support member 42 to base member 20, components 30 may be covered (e.g. hidden, unexposed, unseen, etc.) by shifter assembly 40 until access to components 30 is desired by an occupant (e.g. infrequently used storage areas, increased security, etc.). An occupant may desire physical access (e.g. storage, controls, etc.) and/or visible access (e.g. gauges, info-screens, navigational systems, etc.) to components 30. Referring to FIGURE 1, shifter assembly 40 is slidably coupled to base member 20. Support member 42 may be slidably moved forward so that beverage retainers 32 and controls 38 are hidden from view. The covering of beverage retainers 32 and

controls 38 by support member 42 may provide for a cleaner and more aesthetically pleasing cockpit area.

[0031] Providing a movable shifter assembly 40 advantageously allows the console system 10 to become selectively reconfigurable. For example, operators of the same vehicle may not agree on the configuration of a console (e.g. one operator may prefer to have a storage receptacle as part of the console while another operator may not). A movably coupled shifter assembly 40 allows the layout of the console to be reconfigured to meet the desires and/or needs of different operators.

[0032] According to a preferred embodiment, support member 42 is configured to slidably move relative to base member 20 in a linear manner (shown in FIGURE 1). In an alternative embodiment, support member 42 is configured to slidably move relative to base member 20 in a curvilinear manner (shown in FIGURES 3a and 3b). Referring to FIGURES 3a and 3b, shifter assembly 40 slides in a reciprocating curvilinear manner to selectively cover (shown in FIGURE 3b) and expose (shown in FIGURE 3a) beverage retainers 32. The console configurations shown in FIGURES 1, 3a, and 3b illustrate support member 42 slidably moving in the fore and aft direction of the vehicle. In alternative embodiments, support member 42 may slidably move laterally (i.e. side to side) in a linear or curvilinear motion within the vehicle and relative to base 20. As can be appreciated, any known mechanism for providing slidable movement may be used. According to an exemplary embodiment shown in FIGURES 3a and 3b, grooves 46 (i.e. slots, channels, recesses, guides, etc.) provide for the slidable movement of support member 42 in a curvilinear motion.

[0033] In addition to slidably coupling shifter assembly 40 to base member 20, shifter assembly 40 may be pivotally coupled to base member 20. Referring to FIGURE 2, support member 42 is pivotally coupled to base member 20 along the longitudinal edge closest to the passenger seat. Pivotally coupling support member 42 to base member 20 allows an occupant to rotate shifter assembly 40 between an open and a closed position. In the closed position, shifter assembly 40 covers components 30, while in the open position, shifter assembly 40 exposes components 30. According to an exemplary embodiment, pivotally coupling support member 42 to base member 20 along the longitudinal edge closest to the passenger seat advantageously provides the driver with relatively unobstructed access to components 30 (such as coin holders, beverage retainers, media storage, etc.). In an alternative embodiment, support member 42 is pivotally coupled to base member 20 about a single point and remains in the same plane when pivotally moved from an open position to a closed position. As can be appreciated, support member 42 may be pivotally coupled to base member 20 along any edge or point of support member 42. Alternatively, support member 42 may be detachably coupled to base member 20.

[0034] Referring to FIGURE 4, a console system 10 is shown according to an exemplary embodiment. Console system 10 is a seat-mounted console 12 and includes a base member 20, a plurality of components 30, and a by-wire shifter assembly 40. According to an exemplary embodiment, base member 20 is coupled to a seating system 50. Seating system 50 includes a driver seat 52 and may or may not include a separate passenger seat (not shown). As shown in FIGURE 4, base member 20 is coupled to driver seat 52. Base member 20 includes a plurality

of components 30 such as beverage retainers 32, an armrest 34, and a storage receptacle 36 (positioned under pivotally mounted armrest 34).

[0035] In operation, seat-mounted console 12 moves with driver seat 52 to provide optimal positioning of components 30 and shifter assembly 40 regardless of the positioning of the driver seat. Such a seat-mounted console configuration is advantageous since drivers of different sizes are likely to position the driver seat in different positions in the vehicle. As shown in FIGURE 4, driver seat 52 is slidably movable in the fore and aft direction of the vehicle. In an alternative embodiment (shown in FIGURE 5), driver seat 52 is slidably movable laterally within the vehicle. Longitudinal movement of seat-mounted console 12 is provided to accommodate operators of different height. While lateral movement of seat-mounted console 12 enables driver seat 52 to be moved to the centerline of the vehicle for a center-drive configuration. Further, the exemplary embodiment of FIGURE 5 advantageously provides for configurations in which a front passenger seat is replaced with a cargo area.

[0036] According to an exemplary embodiment shown in FIGURE 4, shifter assembly 40 includes a support member 42 and a gear shift lever 44. As shown in FIGURE 2, support member 42 is fixedly coupled to base member 20. In an alternative embodiment, support member 42 is moveably coupled to base member 20 to allow support member to move between an open position (i.e. a first position) in which components 30 are exposed and a closed position (i.e. a second position) in which components 30 are covered. Support member 42 may be movably coupled to base member 20 in a variety of ways such as being slidably coupled, pivotally coupled, or detachably coupled.

[0037] As illustrated in FIGURE 4, seat-mounted console 12 is shown coupled to a seating system 50 having a divided driver seat 52 and passenger seat 54. As can be appreciated, seat-mounted console 12 is equally applicable to seating systems having a single bench-like seat configuration. If seat-mounted console 12 is applied to a bench seat, seat mounted console 12, including shifter assembly 40, moves relative to the combined driver and passenger seat.

[0038] Referring to FIGURES 6a through 6c, a console system 10 is shown according to an exemplary embodiment. Console system 10 is an instrument panel-mounted console 14 and includes a base member 20, and a by-wire shifter assembly 40. According to an exemplary embodiment, base member 20 is movably coupled to an instrument panel 60. According to an exemplary embodiment, base member 20 is laterally (i.e. side to side) centered within the vehicle and is pivotally coupled to instrument panel 60. As illustrated in FIGURES 6a and 6b, instrument panel-mounted console 14 pivots longitudinally within the cockpit area of the vehicle. Instrument panel-mounted console 14 may be configured to pivots up or down relative to instrument panel 60. In an alternative embodiment, instrument panel-mounted console 14 pivots laterally.

[0039] As illustrated in FIGURES 6a and 6b, console system 10 may include a second base member 22 having a portion that underlies base member 20. Second base member 22 may be configured to support a plurality of components (not shown), and particularly may be configured to support a variety of components on the portion that underlies base member 20. Referring to FIGURE 6a, base member 20 may be rotated down so that an occupant may gain access to components positioned on the portion of base member 22 that underlies base

member 20. Referring to FIGURE 6b, base member 20 may be rotated upward so that shifter assembly 40 is optimally placed for the driver. In an alternative embodiment, base member 20 may be rotated upward to expose components disposed beneath base member 20, and may be rotated downward so that shifter assembly 40 is optimally placed for the driver.

[0040] It is important to note that the construction and arrangement of the elements of the console provided herein are illustrative only. Although only a few exemplary embodiments of the present invention have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible in these embodiments (such as variations in installation location and orientation within a vehicle, sizes, structures, shapes and proportions of the various elements, mounting arrangements, use of materials, combinations of shapes, etc.) without materially departing from the novel teachings and advantages of the invention. For example, the term console is not intended to be limited to consoles mounted on the floor of a vehicle or to a seating system of a vehicle. Consoles may be mounted to a variety of vehicle structures including, but not limited to, side panels, doors, instrument panels (i.e. dashboards), and overhead structure. In addition, the present invention is not limited to consoles having transmission controls coupled to them, but is intended to include any control system that may be coupled to a console that conventionally requires a mechanical linkage that would prevent the console from being movable or selectively reconfigurable. For example, it is commonly known to couple the controls of a parking brake to a vehicle console. The scope of the present invention encompasses a console system having a by-wire controlled parking brake assembly

coupled to the console. Other controls, such as acceleration controls and engagement controls (e.g. controls for engaging a snow plow, a bucket of a tracker, a rotating blade on farm equipment, etc.) may also be coupled to the console of the present invention. Further, the scope of the present invention includes console configurations as shown in FIGURE 7, wherein the console may be folded or selectively positioned so that a pass through area is created.

[0041] While the present invention has been described in connection with a particularly preferred embodiment thereof, the invention is not to be limited by the drawings. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments. Any functional elements are intended to cover the structures described herein as performing the recited function and not only structural equivalents but also equivalent structures. Other substitutions, modifications, changes and omissions may be made in the design, operating configuration and arrangement of the preferred and other exemplary embodiments without departing from the spirit of the inventions as expressed in this provisional application.

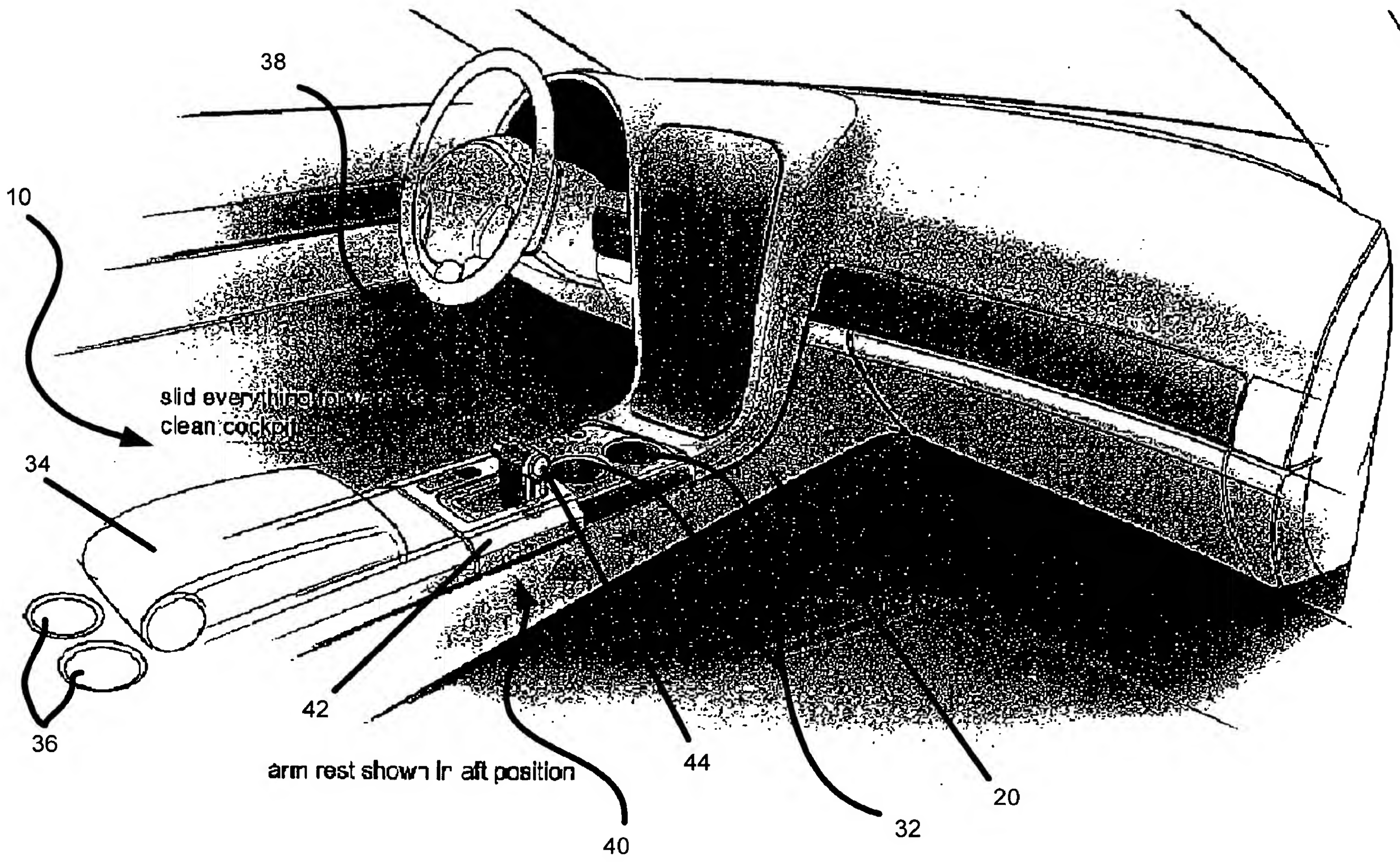
38
10
slid everything
clean cockpit
34
42
36
arm rest shown in aft position
40
44
32
20

FIGURE 1

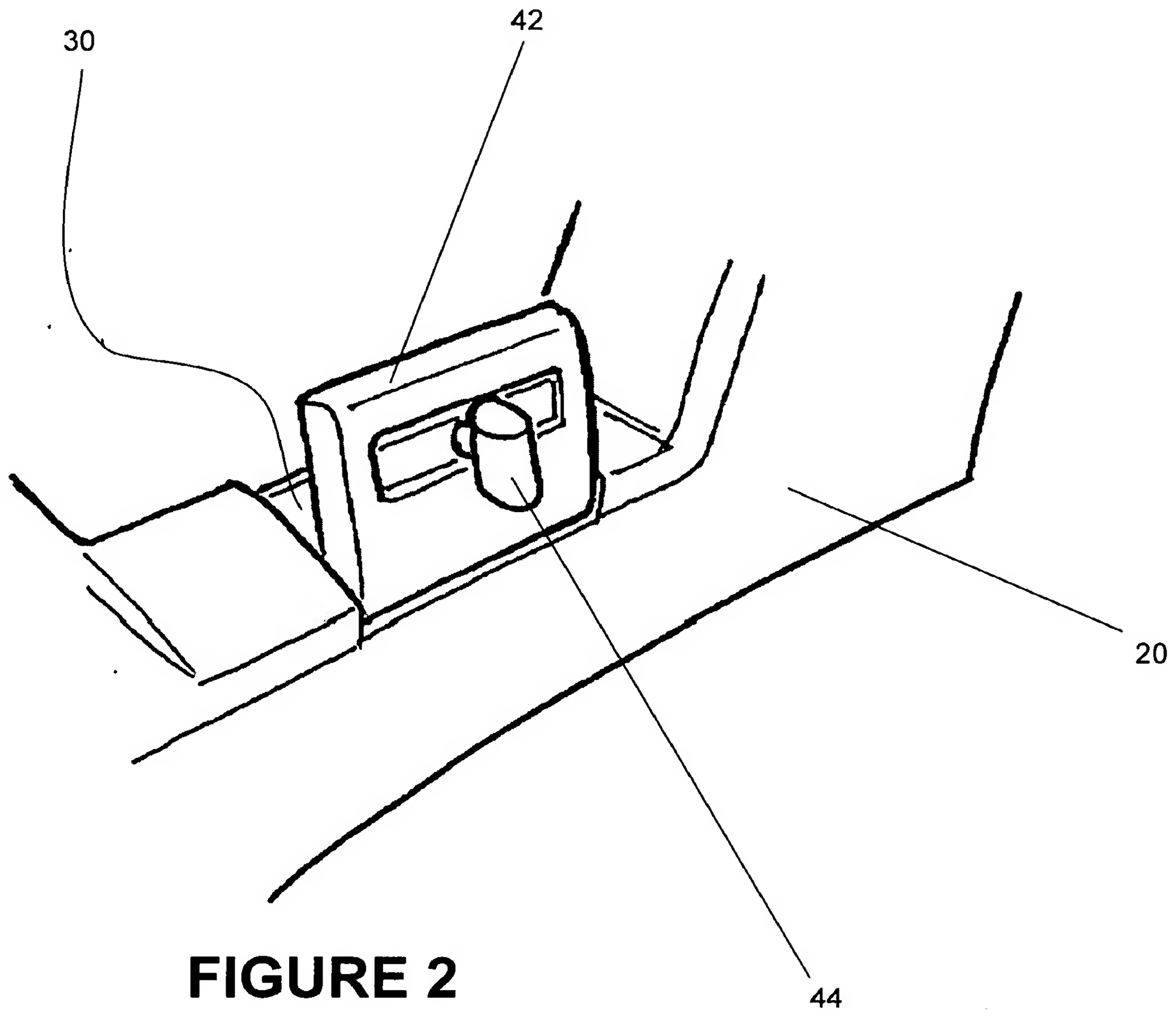

FIGURE 2

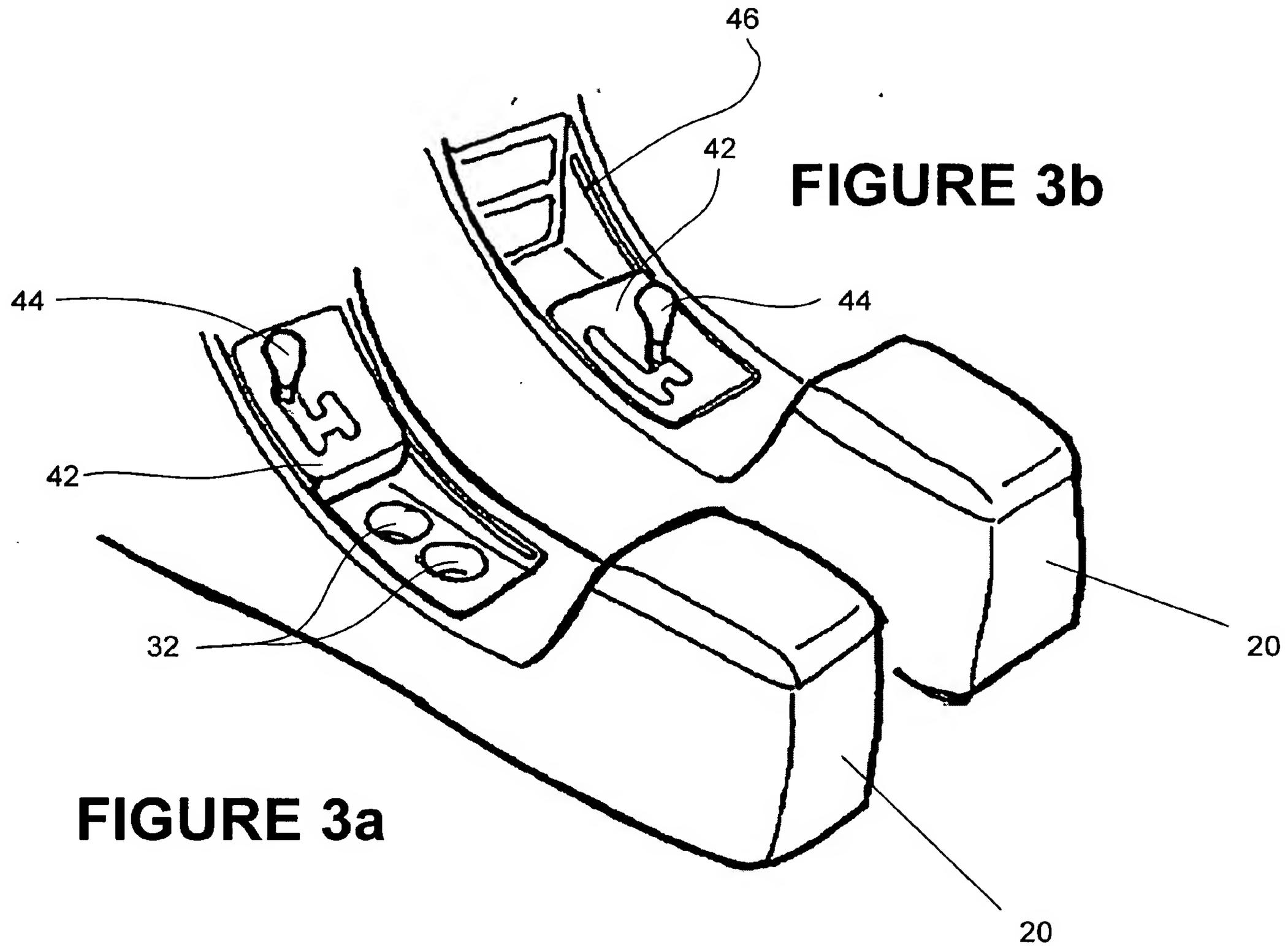

FIGURE 3b

FIGURE 3a

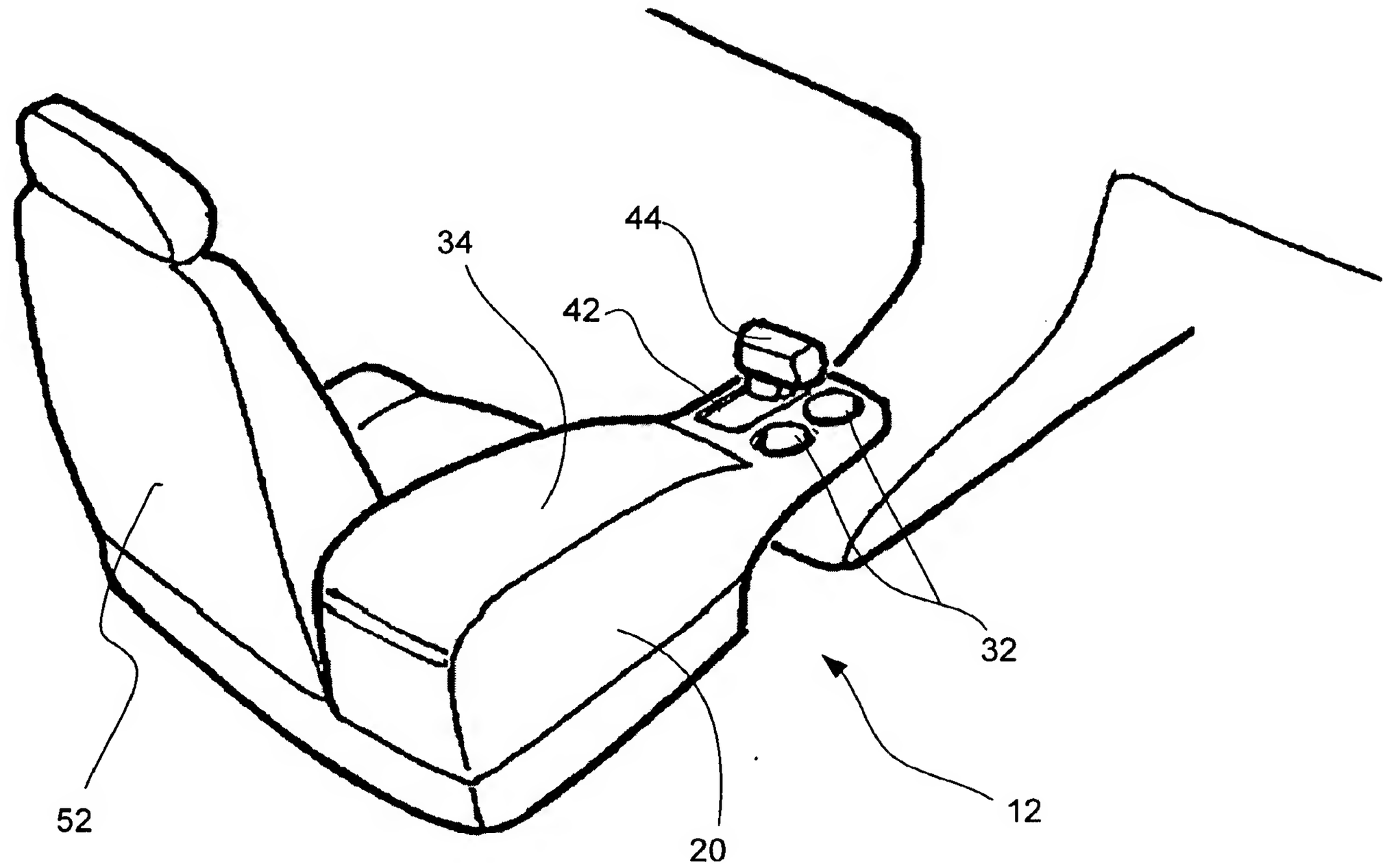

FIGURE 4

PLAN VIEW

DRIVER w/ PASSENGER OR CARGO SCENARIO

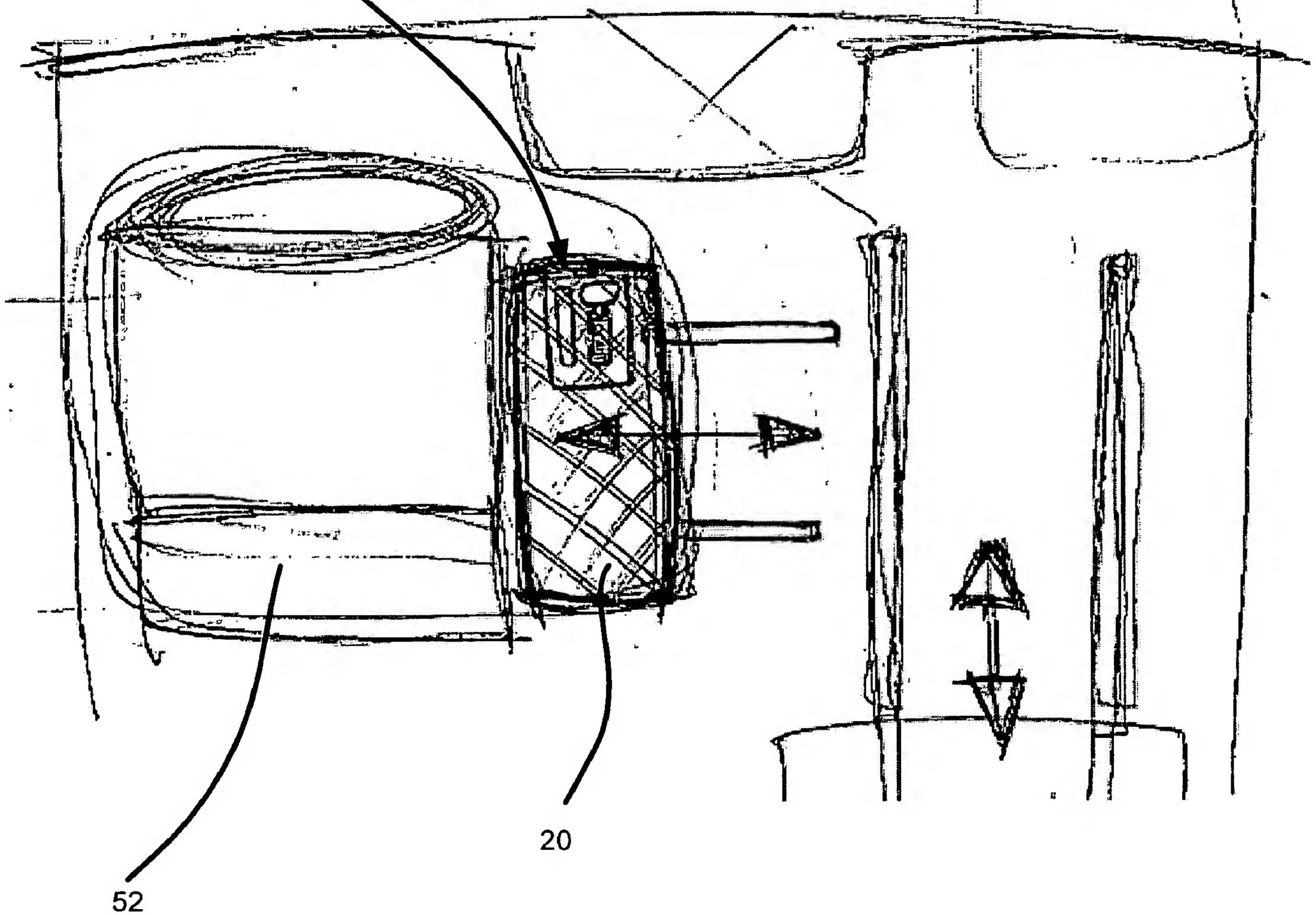

FIGURE 5

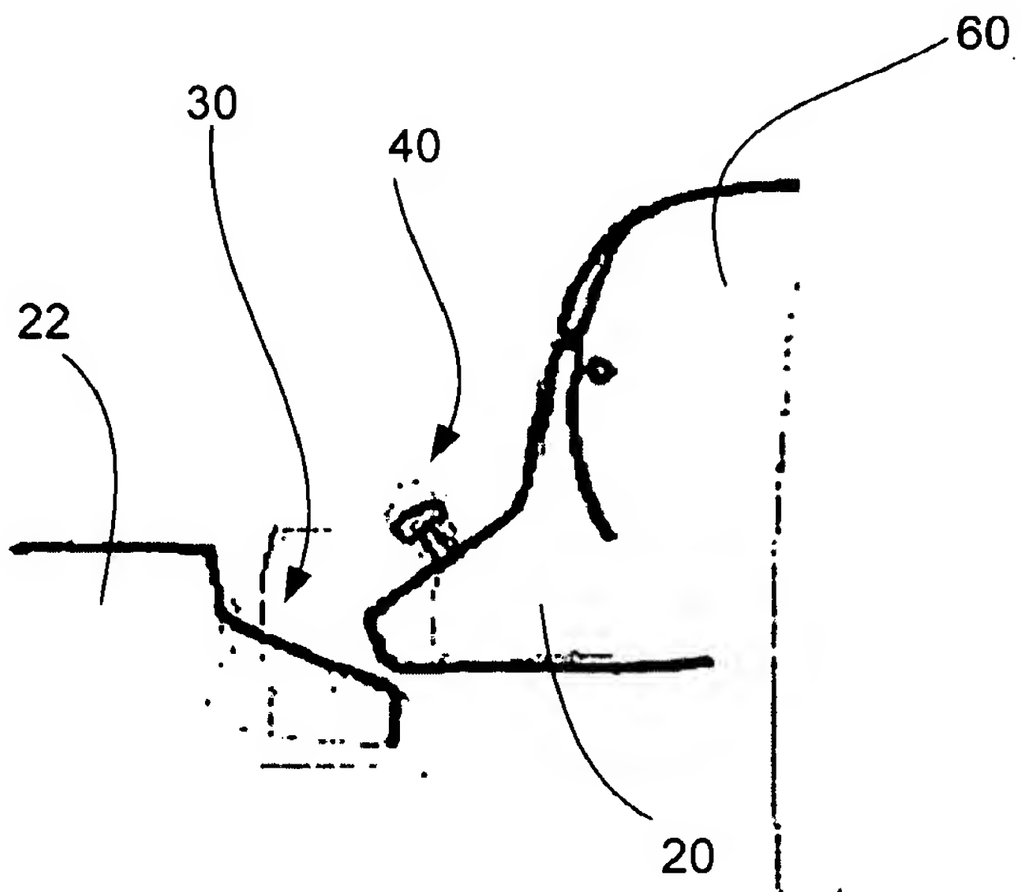

FIGURE 6a

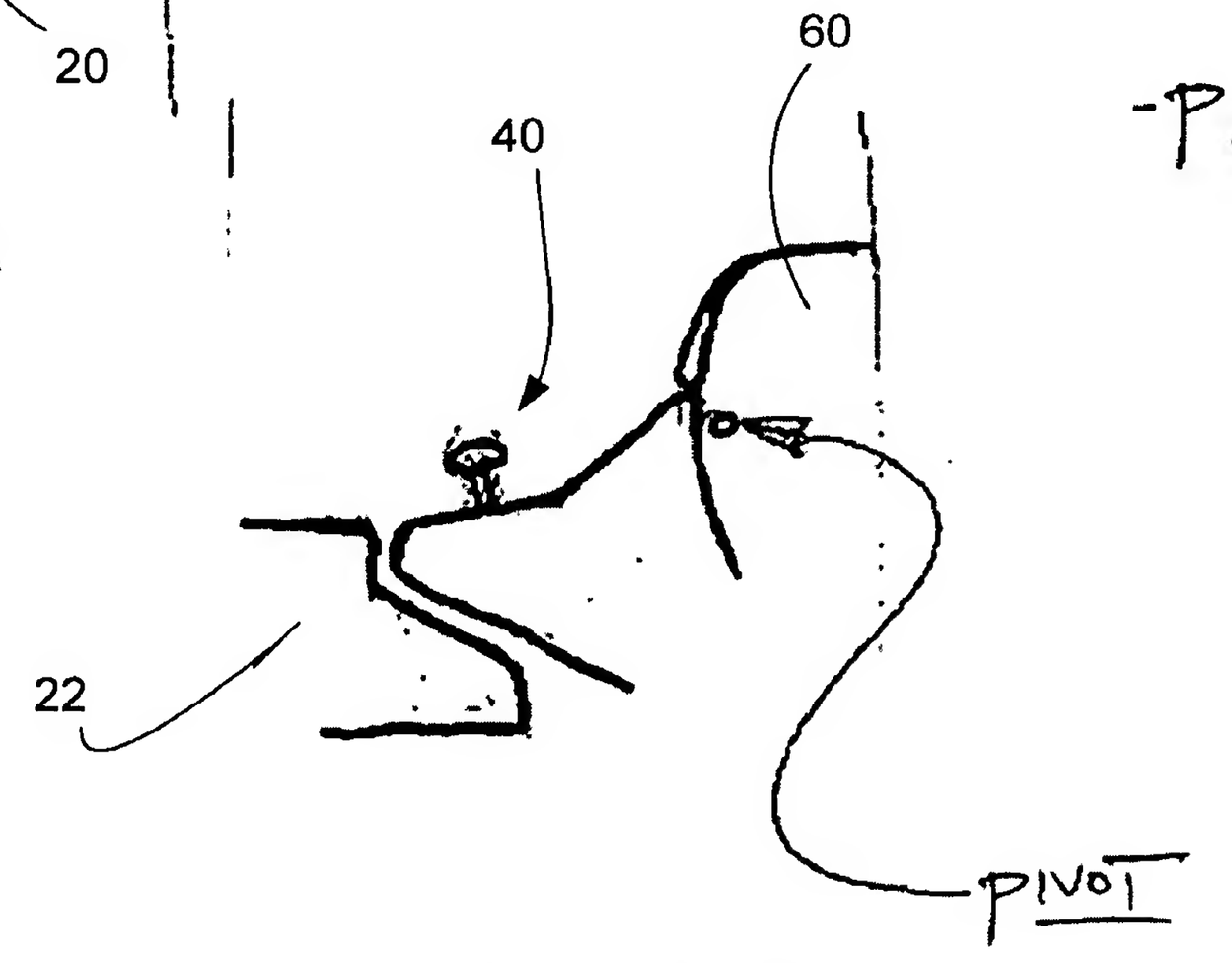

FIGURE 6b

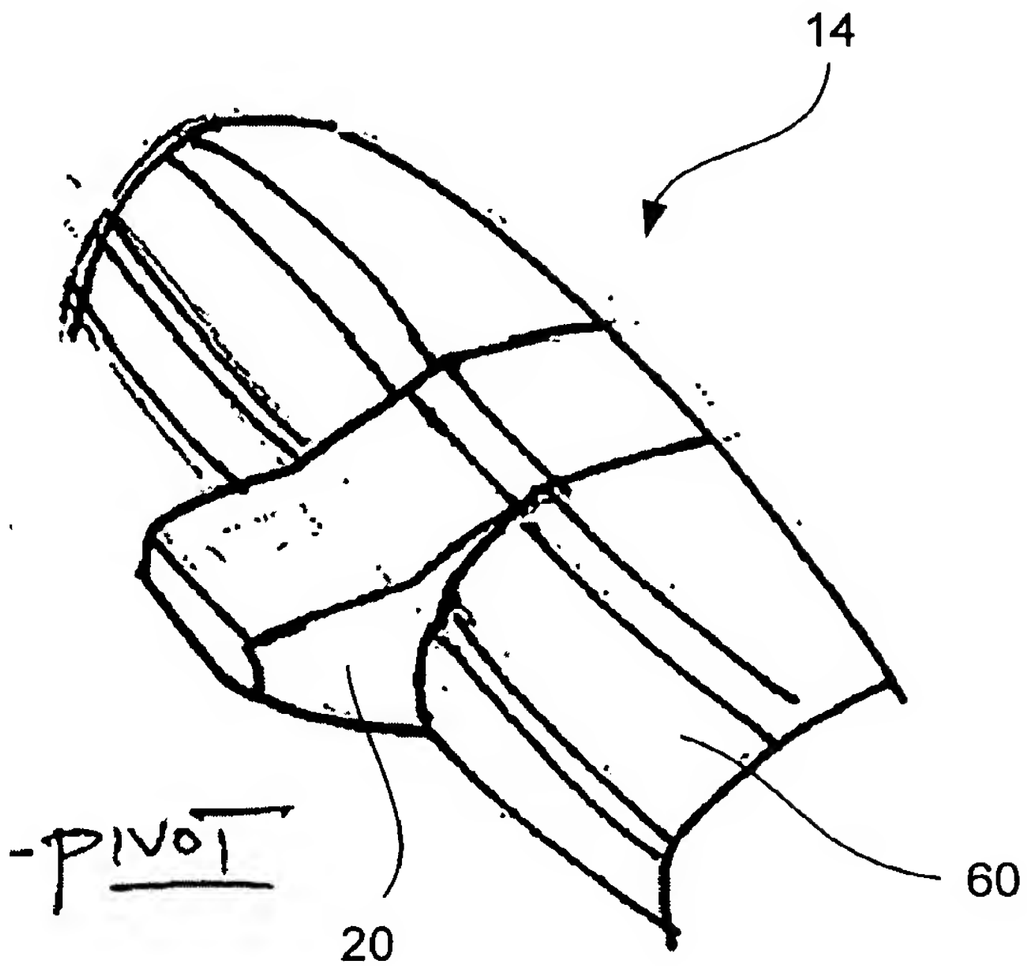

FIGURE 6c

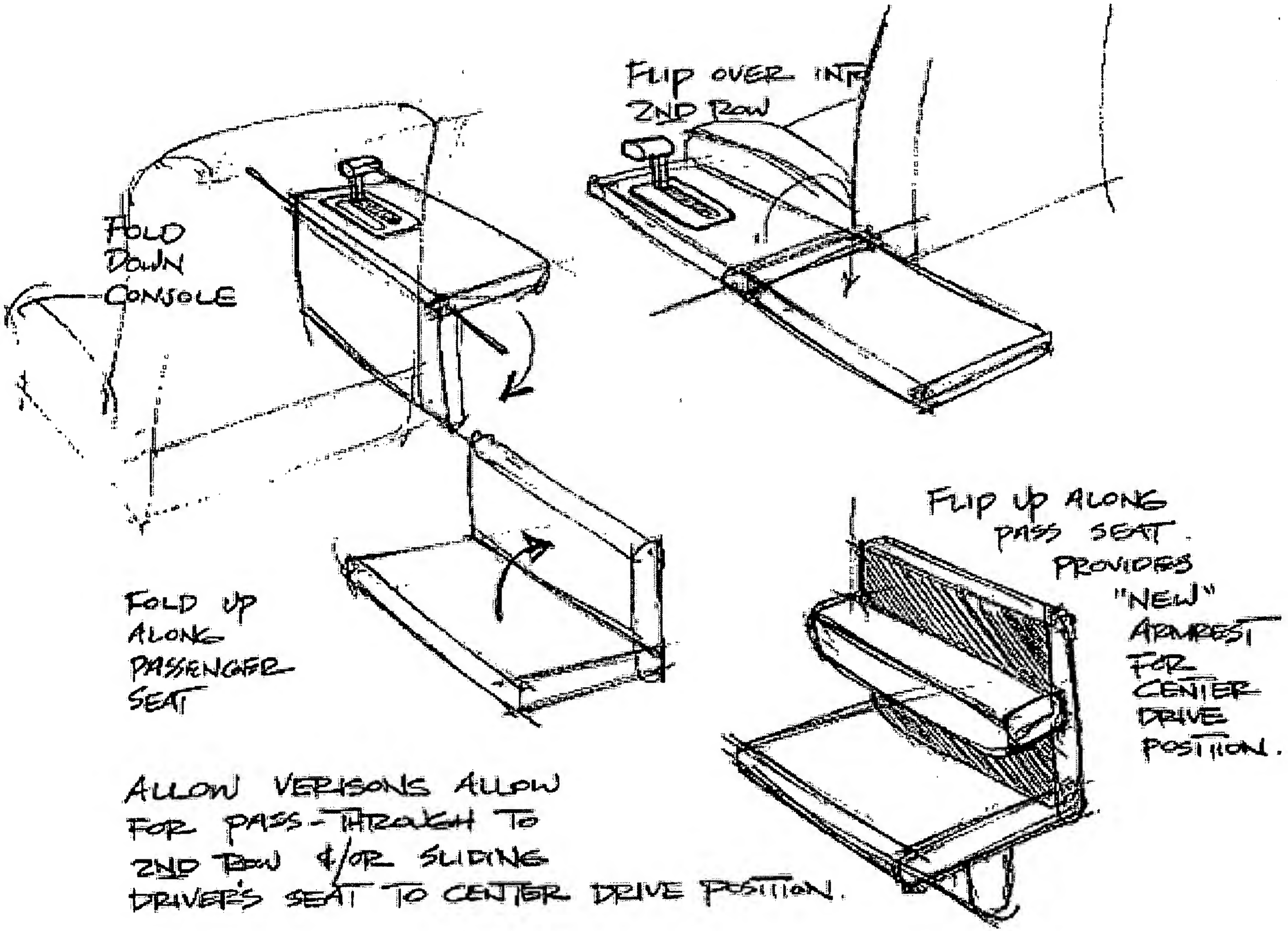
FOLD DOWN CONSOLE
FLIP OVER INTO 2ND ROW
FOLD UP ALONG PASSENGER SEAT
FLIP UP ALONG PASS SEAT. PROVIDES "NEW" ARMREST FOR CENTER DRIVE POSITION.
ALLOW VERSIONS ALLOW FOR PASS-THROUGH TO 2ND ROW &/OR SLIDING DRIVER'S SEAT TO CENTER DRIVE POSITION.

FIGURE 7

Application Data Sheet

Application Information

Application Type::	Provisional
Subject Matter::	Utility
Suggested classification::	
Suggested Group Art Unit::	
CD-ROM or CD-R?::	None
Computer Readable Form (CRF)?::	No
Title::	BY-WIRE ENABLED CONSOLE
Attorney Docket Number::	026032-4364
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	1
Total Drawing Sheets::	7
Small Entity?::	No
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
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Status::	Full Capacity
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Family Name::	Spykerman
City of Residence::	Zeeland

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City of mailing address::	Zeeland
State or Province of mailing address::	MI
Postal or Zip Code of mailing address::	49464

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Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::

Foreign Priority Information

Country::	Application number::	Filing Date::	Priority Claim d::

Assignee Information

Assignee name:: Johnson Controls Technology Company